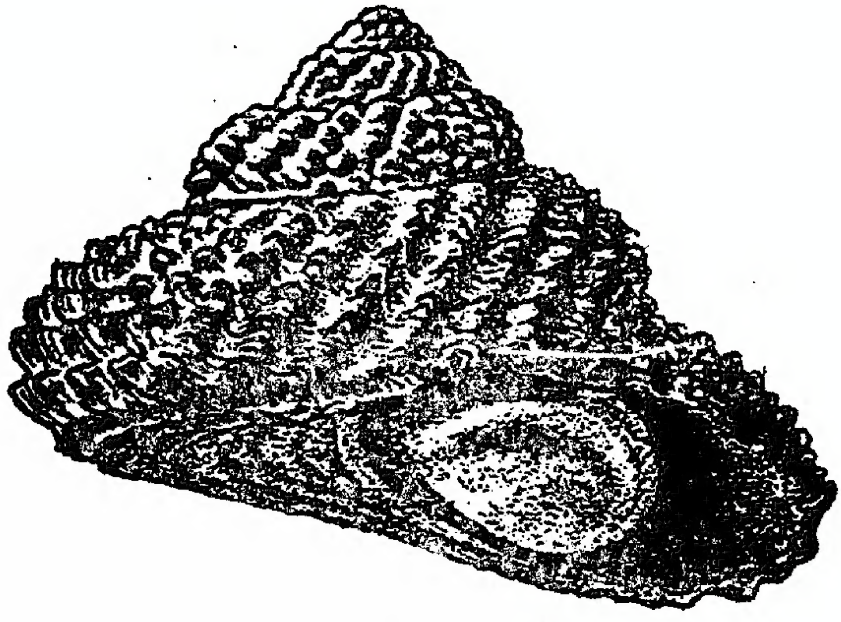
COOKIA



Journal of the Wellington Shell Club

New Zealand

Vol 5 No 2

OCTOBER 1982

PUNCTIDAE: OR WAYS TO CRAWL ON THE HEAD OF AN ANGEL

F. M. Climo
August 1982

These notes are a telegraphic summary of the last 10 years work, none of it published yet. The interrelationships discussed are too complex to hold in the memory from projected slides and sections cannot easily be uplifted for a talk without fragmentation of the story, hence this read-along material.

Orientation. Subclass: PULMONATA
Order: STYLOMMATOPHORA
Suborder: SIGMURETHRA
Superfamily: ENDODONTACEA
Family: PUNCTIDAE Morse, 1864
Punctum Morse, 1864
Type species: Helix minutissima Lea, 1841. Recent, Nearctic.

Etymology. Punctum - a dot (pin-head; point); reference to small size, type species about 1.5mm maximum diameter.

Global diversity. (Higher taxonomic groupings will be related to global distribution in Fig. 16 after presentation of some back-ground).

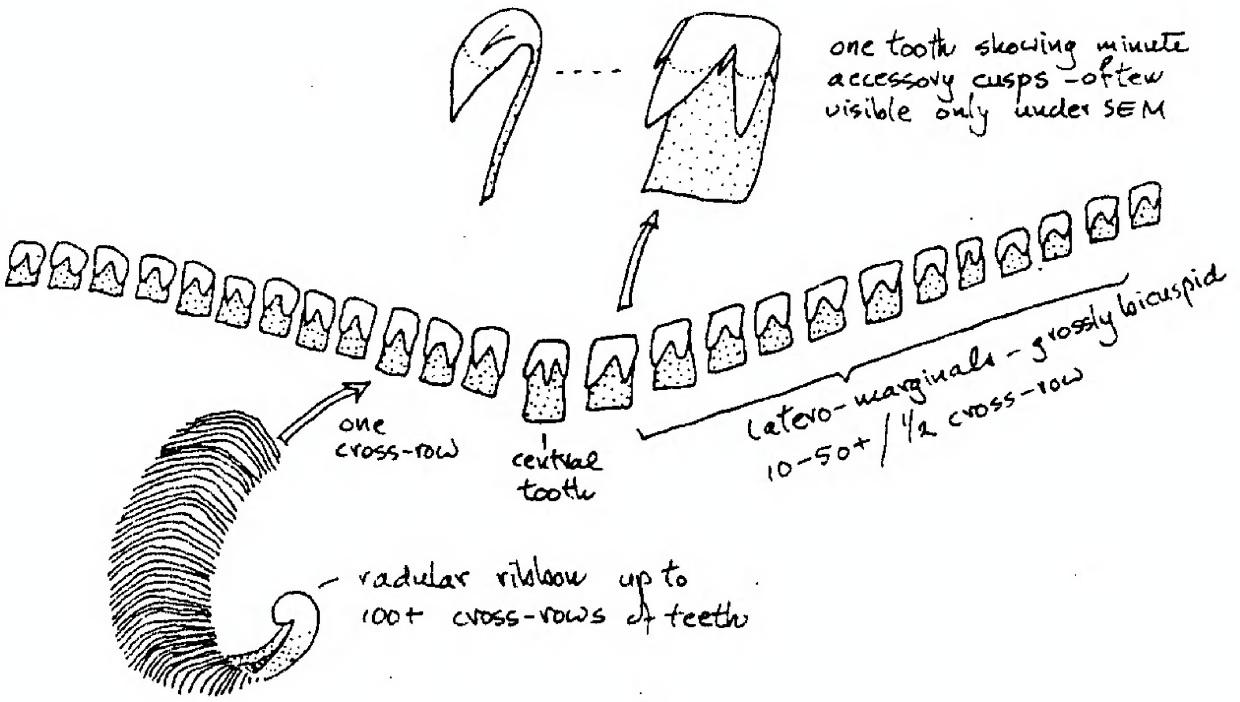
Area	No. of species	% described
Eurasia	1	100
Africa	2†	100
North America	5†	100
South America	1†	100
Juan Fernandez Is.	3	100
New Guinea (alpine)	1	100
Australia & Lord Howe	50†	50
New Zealand	220†	35

† - indicates a 'cosmopolitan' species that has not been dispersed by modern man. Interesting implications here - another story altogether.

Taxonomy. For purposes of classification 4 morphological systems have been examined: radula; the embryonic shell or protoconch; reproductive system; post-embryonic shell or teleoconch. They are discussed below in that order which is a reflection of a trend from most stable to least stable (and variable).

Fig. 1 with its appended definitions lays out my philosophy regarding taxonomic methodology.

Radula. Fig. 2 summarises the characteristics of the punctid radula.

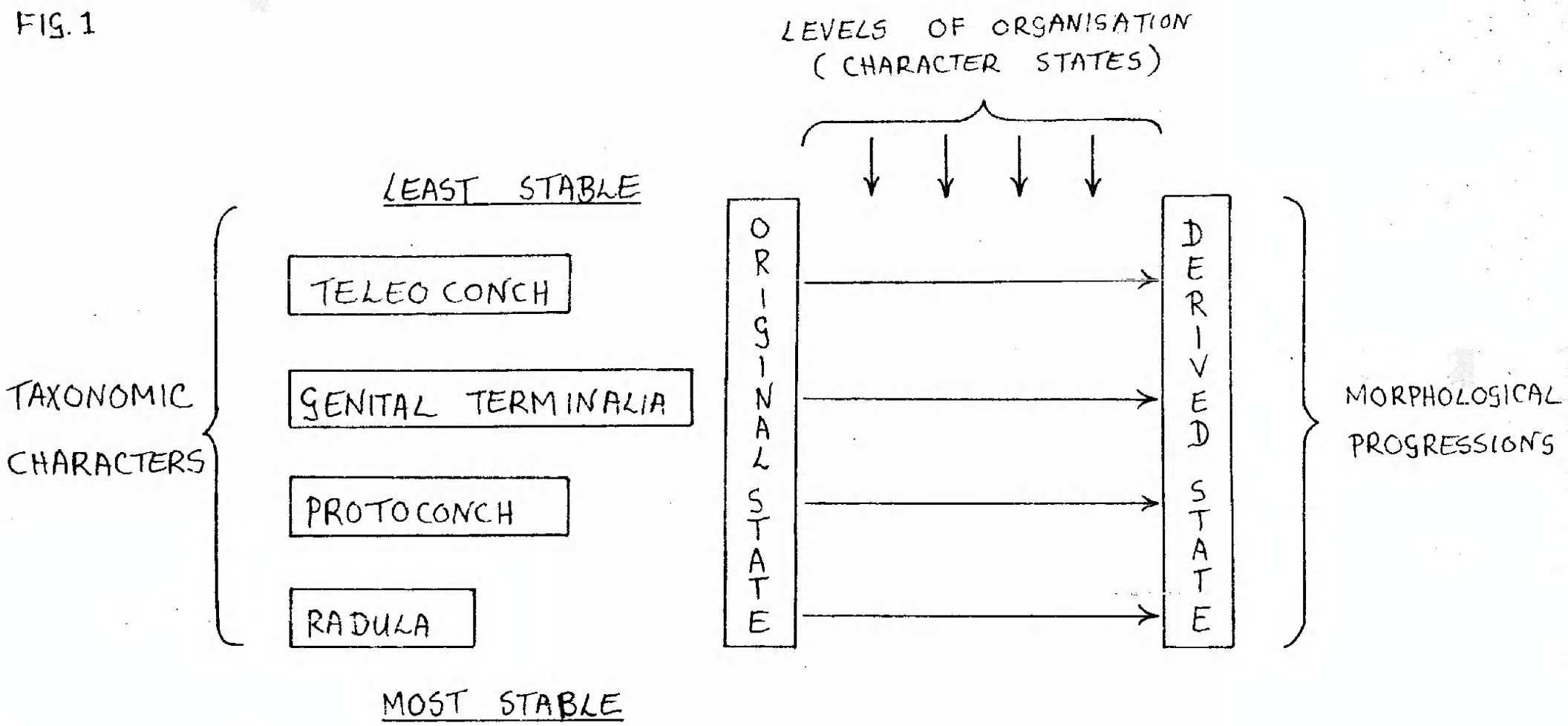

one tooth showing minute accessory cusps - often visible only under SEM
Latero-marginals - grossly bicuspid
10-50+ / ½ cross-row
one cross-row
central tooth
radular ribbon up to 100+ cross-rows of teeth

All pallial and reproductive system features being right (placing us in Sigmurethra; Endodontacea - not discussed here) the above type of radular configuration effectively defines the family.

Punctidae is regarded as the most primitive stylommatophoran pulmonate family. Its feeding-related radular specialization is probably ancient in origin. Numbers of teeth increase with increase in animal size but there is no appreciable increase in tooth size.

It follows that teeth are size-specialist as well as shape-specialist. Probably for raking-up bacterial, fungal or algal slimes. No punctids have shell diameters greater than about 6mm. The feeding specialisation is probably energy-

FIG. 1



level of organisation: a character state of an organ or structure, with or without independently derived analogues in parallel morphological progressions

morphological progression: a progressive change in a character state from an original to a derived condition

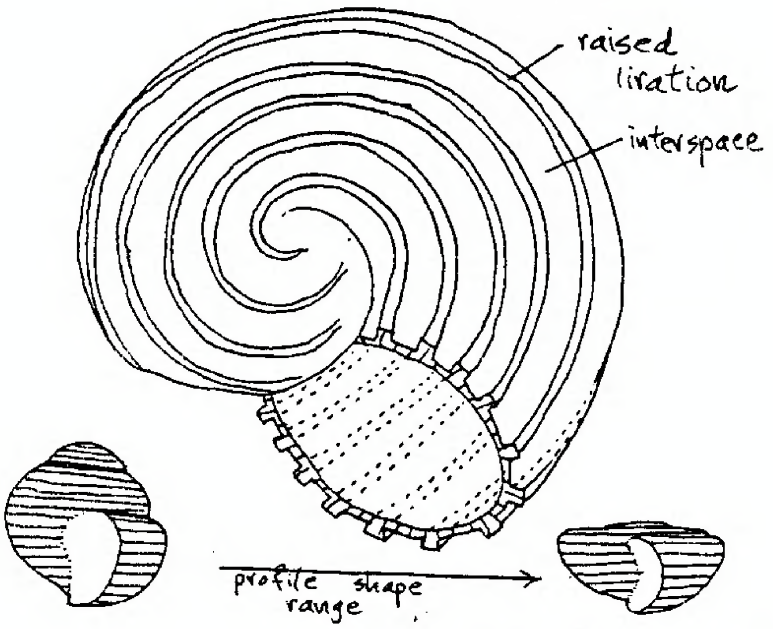
restrictive, providing only enough food to support a limited animal size. Largest punctids (e.g. mariae ; sciadium) live in sloshy habitats or those concentrating slime layers (e.g. interfaces in wet broad-leaf litter).

Conversely, the tooth-size being so minute (average height of a latero-marginal is μm) punctid snails are free to miniaturise their bodies (as a specialisation for exploiting litter microhabitats) and rake in enough food for their requirements with only about 10 teeth in a half-cross-row. Reduction in numbers of the somewhat larger teeth of other endodontacean snails (e.g. Charopidae) would seem to provide ineffective food-gathering devices - they just don't get as small as punctid snails. More about miniaturisation (and gigantism) later.

The radular specialisation is definitive of Punctidae. An old conservative state useful for orientation at family level but not useful (at the level of attention I've given it) for sorting at lower taxonomic levels.

Protoconch. Fig. 3 shows the gross features of a punctid protoconch.

The protoconch encapsulates both the embryo and the post-embryonic hatchling. It has to be strong enough to support its own weight and that of the enclosed animal, withstand the tensions developed by attached muscles, and, cope with environmental traumas such as impacts from mobile particles in the snail habitat.



In larger snails (over 2mm greatest dimension) or in those with particularly thickened shells, the criss-crossing calcium carbonate crystal lattice, covered by a periostracal skin, seems sufficiently strong to prevent collapse. That condition is probably derived, by simplification, from thinner-shelled ancestors that strengthened their protoconchs with raised reinforcing sculpture; the latter requiring less calcium carbonate than a uniformly thickened shell. Lime is not always abundant, particularly in forest-litter habitats.

Since the teleoconch wraps around the protoconch leaving only the basal section and emergent upper half of the whorl visible, discussions on protoconch structure, below, are restricted to that section visible above the first teleoconch whorl. The sculpture around the circumference of the coiled embryonic tube is not strongly regionally differentiated and, consequently, reference to the dorsal emergent section of the protoconch is an accurate representation of the whole structure.

In those taxa with raised surface sculpture, reinforcement of the protoconch is achieved principally by spiral lirations. The structure and spacing of the lirae varies quite widely between taxonomic groups as do the number of lirae. The number of lirae varies from 7 to plus 40 on the dorsal emergent section of the protoconch. Lirae are increased in number on larger protoconchs by dichotomy of primary structures and are reduced in number, in especially minute species, by suppression of alternate lirae. The number of lirae is, then, roughly correlated with size of the embryonic cylinder and in thin-shelled species at least, the lirae appear to play some strengthening role. Their obsolesence on both heavily calcareous and/or large protoconchs probably reflects a neutral selective value. The high number of lirae on particularly large protoconchs probably reflects the arrangement of the groups of cells that are producing the structures and not a changing engineering principle. The size of the lirae proportional to the thickness of the protoconch shell becomes much smaller on larger protoconchs and it seems inconceivable that they perform any strengthening role in such species. The groups of cells that are programmed to produce lirations

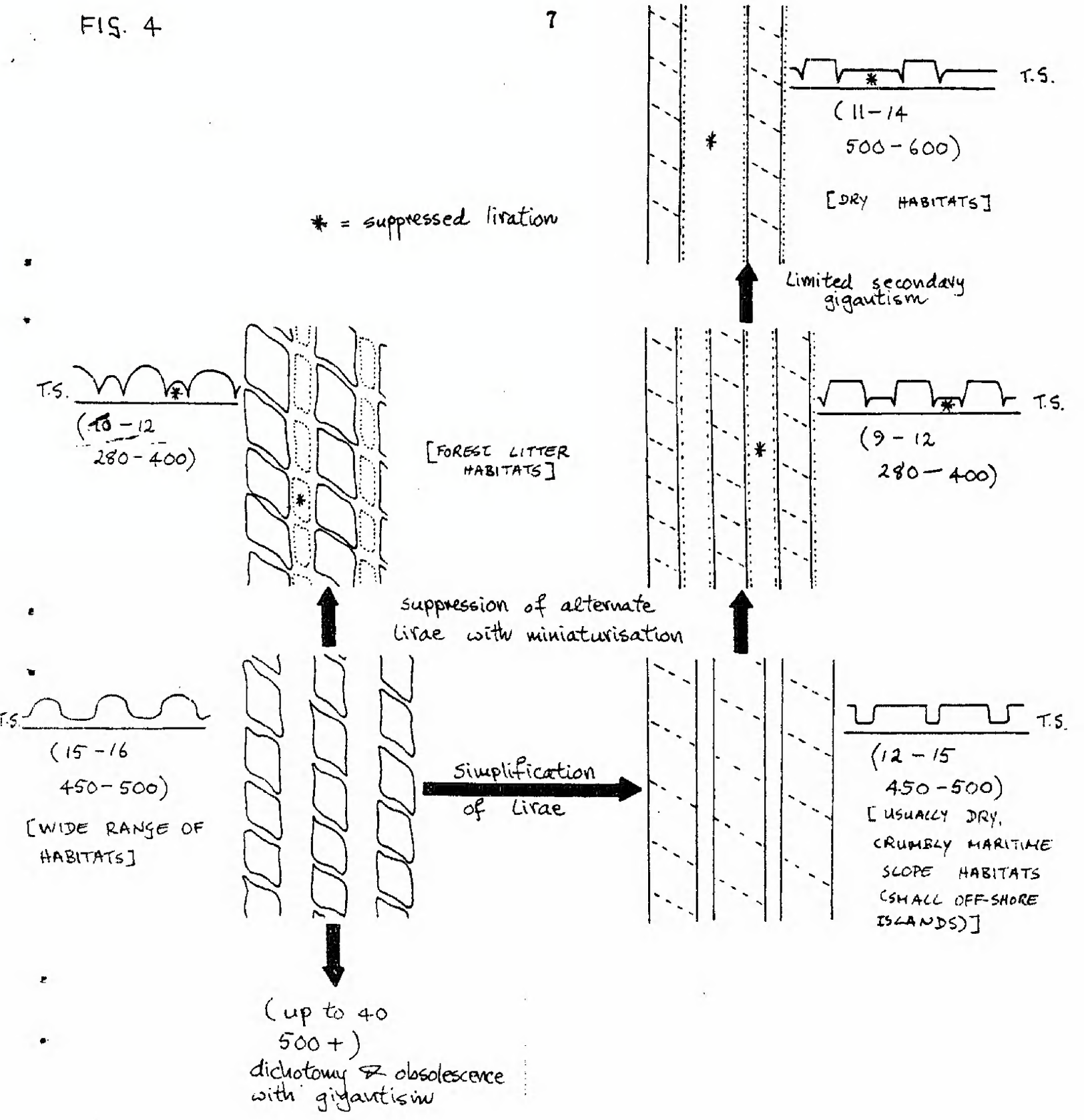
of a certain size and spacing seemingly merely bifurcate as a protoconch gets larger, to produce more lirae with similar spacings. These dichotomies are clearly visible on the last quarter-whorl of Paralaoma caputspinulae, for example. More often than not, though, the increased number of lirae is manifested over the length of the protoconch spiral and becomes a definitive feature of the species or genus.

Clearly, the protoconch has to be used with caution as a taxonomic character. Among the most minute species, and those with thin shells, the proportionally large lirae seem to have a high selective value because similar structural end-points have been achieved in different ways (cf. nsp 22 and nsp 25; Fig. 17) in similar-sized snails from similar habitats. The strength of the lirae in especially minute punctid snails, their varied structure and their apparently high selective value, makes the protoconch very important as a taxonomic character at this level of organisation in the Punctidae. This is extremely fortuitous because anatomical simplification in snails less than 2mm maximum diameter makes it nearly impossible to interpret species-recognition characters of the reproductive duct lumina within acceptable margins of error.

The value of the protoconch as a primary taxonomic character changes with the move towards gigantism in Punctidae. All large punctids seem to be derived from ancestors with one type of protoconch and only the numbers of lirae vary. This in itself is useful for recognising sibling species, and in some cases genera, but the protoconch is not as taxonomically important in large punctid snails as it is in the smaller snails. Species-recognition structures of the male genitalia are the most important taxonomic characters for distinguishing groups of larger puctid snails, but where structures are clearly divergent they are useful as confirmatory evidence for protoconch-based taxa at the most minute end of the punctid size spectrum. The teleoconch alone is unreliable as an indicator of primary groupings within the family serving instead to indicate the ecological placement of the species in the habitat.

Fig. 4 summarises sculptural changes in the punctid protoconch at that small end of the size range where such sculpture seems to have a high selective

FIG. 4


* = suppressed liration
T.S.
(11–14
500–600)
[DRY HABITATS]
Limited secondary gigantism
T.S.
(10–12
280–400)
[FOREST LITTER HABITATS]
T.S.
(9–12
280–400)
suppression of alternate lirae with miniaturisation
T.S.
(15–16
450–500)
[WIDE RANGE OF HABITATS]
Simplification of lirae
T.S.
(12–15
450–500)
[USUALLY DRY, CRUMBLY MARITIME SLOPE HABITATS (SMALL OFF-SHORE ISLANDS)]
(up to 40
500+)
dichotomy & obsolescence with gigantism

value (low numbers in parentheses refer to the number of emergent lirae; high numbers refer to protoconch diameter in μm at 1 3/8 whorls).

Reproductive system. Punctidae, as do other endodontacean pulmonates that have not evolved elaborate courtship rituals, recognise each other by the act of copulation (the ultimate in stream-lined courtship!). There must, obviously, be some externally obvious (to the snails) threshhold at which the wrong mate can be detected before copulative testing of the recognition surfaces is attempted, but we know nothing of that yet.

Punctid snails have a limited size range that is apparently determined by their food-gathering specialisation (see above). Many species occur in sympatry in all parts of New Zealand (10-22 species in favourable localities: 25-53% of the land snail fauna at any one site).

It is vital to understand how these species-recognition structures have evolved within the family before any phylogenetic speculation can be attempted. 10 years of dissection have these patterns pretty well defined now.

Diversity of structure beyond the need for spermatophore formation, and character displacement in recent sympatries of presumably once allopatric siblings, are the two factors that suggest that copulative recognition surfaces exist.

The recognition surfaces are on the evertable surfaces of the penis lumen and on the reciprocal copulatory surface of the female system. For ease of dissection - and half the amount of work - only the male system is discussed here.

Fig. 5 shows the external features of the complete punctid reproductive system.

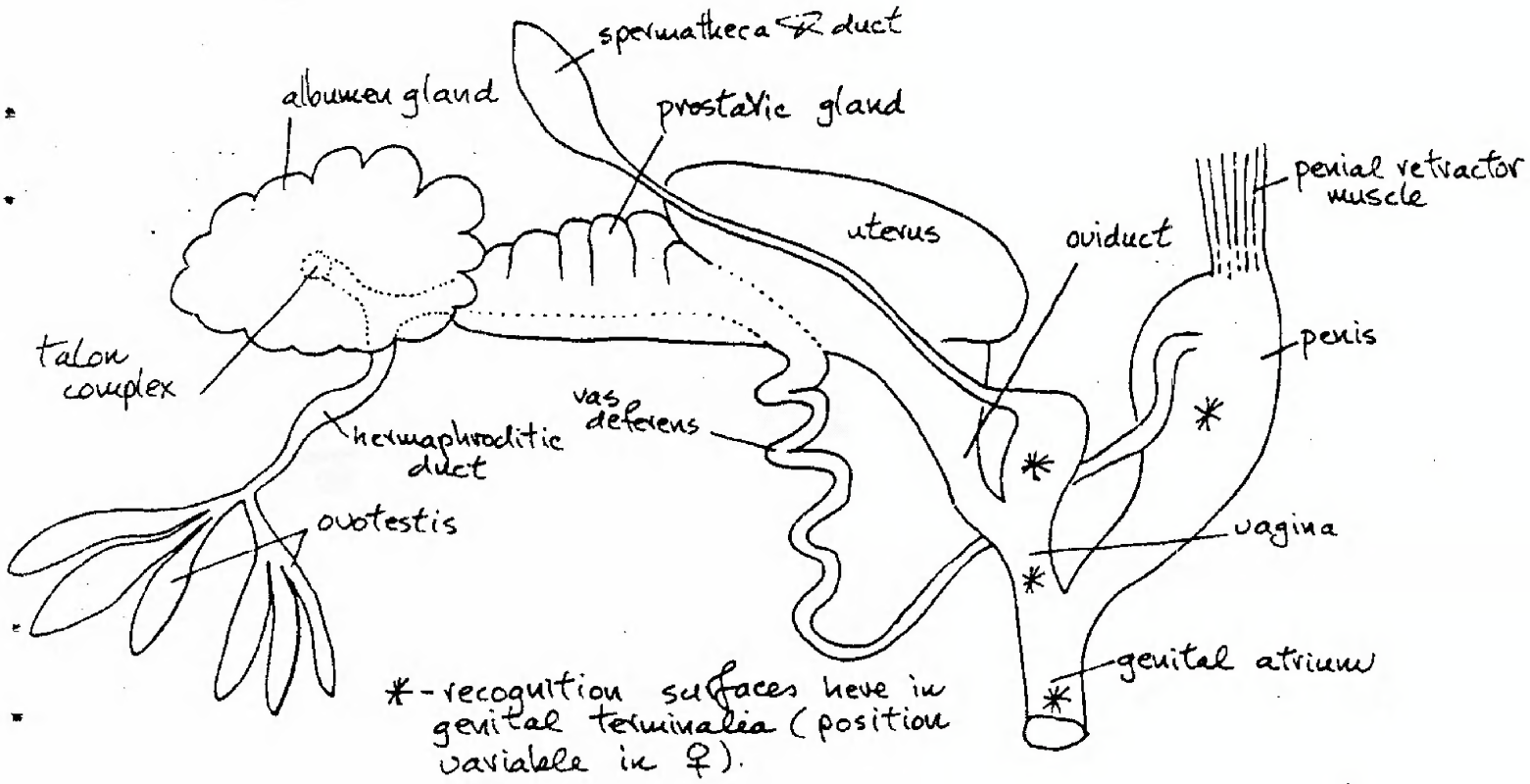


Fig. 6 shows a typical arrangement of structures within a penis lumen.

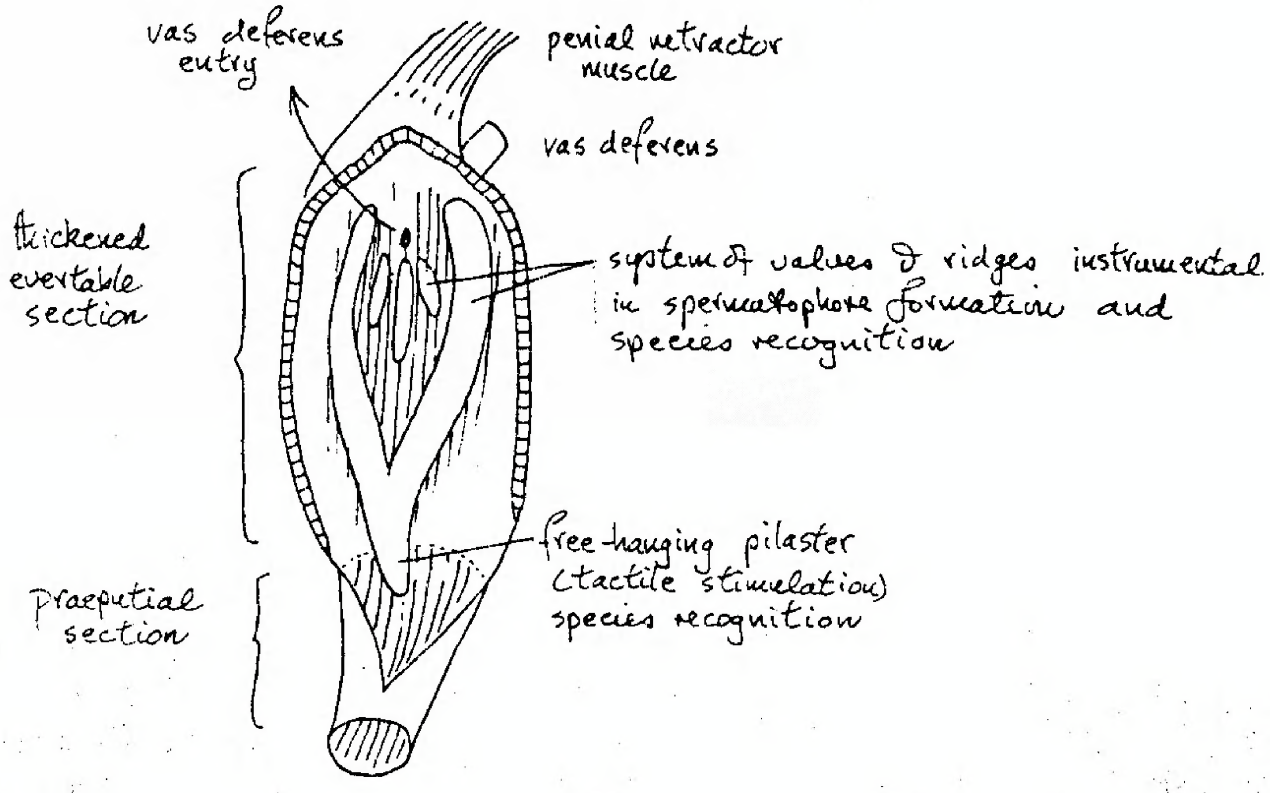

vas deferens entry
penial retractor muscle
vas deferens
thickened evertable section
system of valves & ridges instrumental in spermatophore formation and species recognition
free-hanging pilaster (tactile stimulation) species recognition
praeputial section

Fig. 7 traces the morphological changes in the ridge-valve-pilaster system, that is, collectively, diagnostic at the family level. Homologous structures are coded, component part names (a complex new jargon) are ommitted, subfamily boundaries (dashed lines) and major levels of organisation (dotted lines) are indicated. Boxed arrows show directions of morphological change and thin arrows show position of vas deferens opening.

Teleoconch. The shell of punctid snails ranges from 1.2mm to approx. 6mm maximum diameter. Shells are unicoloured or have complex colour patterns. Throughout the size range all degrees of spire elevation and flattening occur. Shell peripheries show all gradations from rounded to carinate. Whorl acceleration varies. Umbilical closure varies and is usually correlated with acceleration changes. The ancestral endodontacean axial sculpture of primary and secondary riblets - incorporating calcium carbonate and periostracal components - is present or variously modified. There are no punctid slugs.

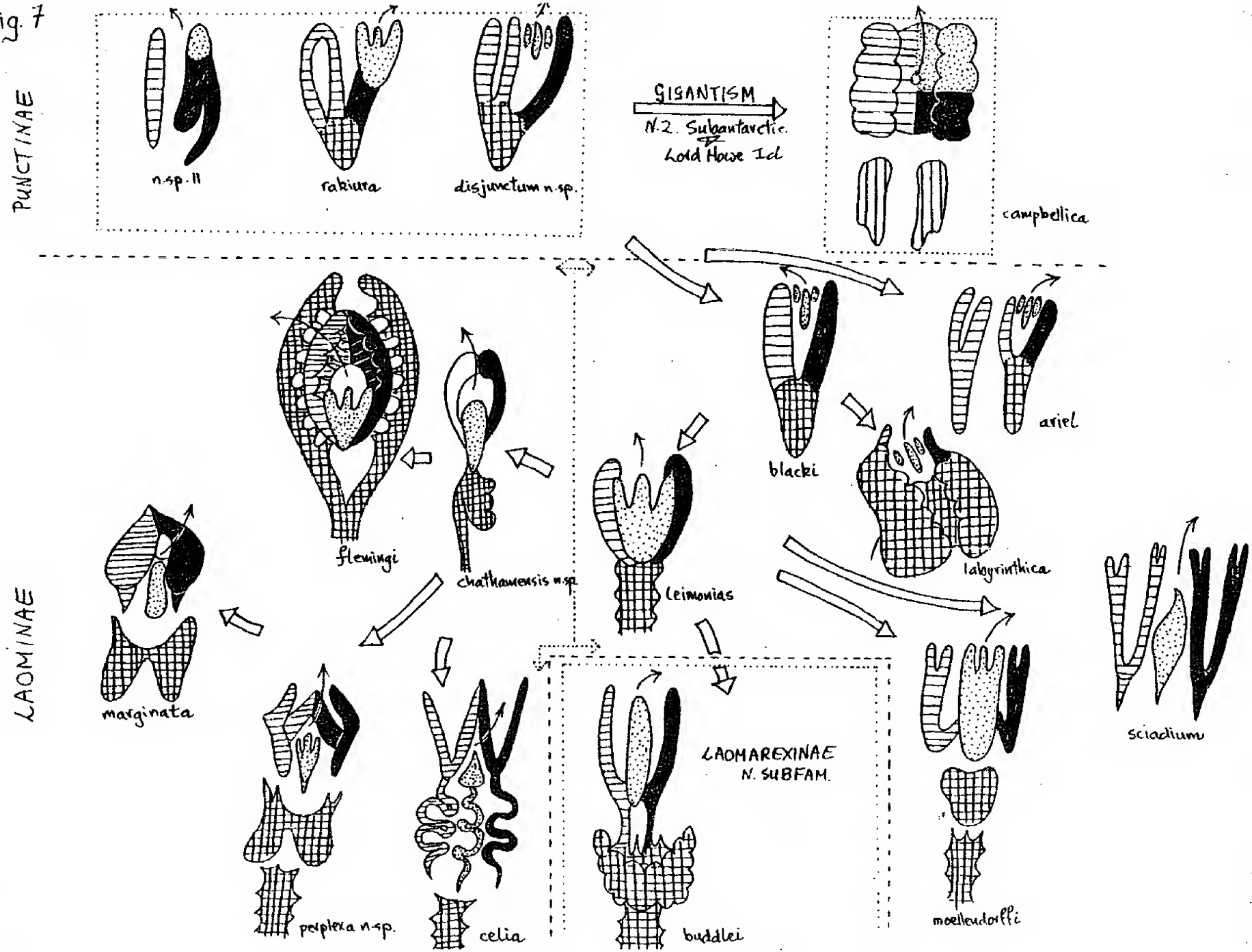
Figs. 8-15 illustrate some teleoconch morphological progressions not all of which occur as monophyletic sequences.

The time-consuming element in trying to classify New Zealand Punctidae has been sorting out the teleoconch parallelisms. Most shape, size and sculptural combinations have occurred more than once (they are not descent-related), presumably the results of similar selective processes for similar niche-specialisations. Where a nice reliable externally visible check against teleoconch is available (the protoconch in small, thin-shelled species) parallelisms can be quickly sorted out. Unfortunately, as mentioned above, the larger species have outgrown their dependence on the strengthening qualities of protoconch sculpture which is more often than not obsolete in such species. Dissection is time-consuming and is often held up for want of a freshly preserved and adequately relaxed specimen. The same species must be dissected in sexually active and inactive phases, too, to make comparison between species possible.

Fig. 16 is a verbal taxonomic summary of the family.

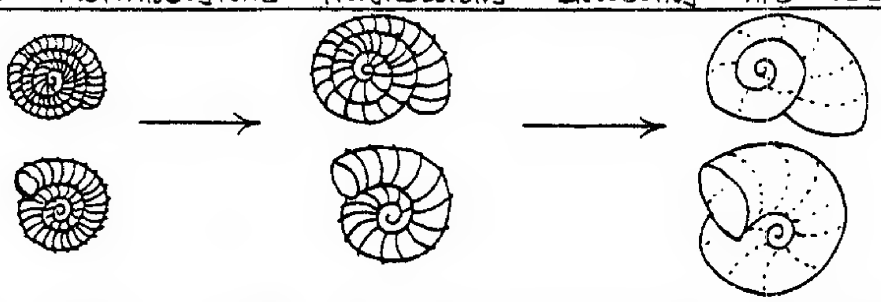
The following Figs illustrate parallelisms that can be separated on

Fig. 7


PUNCTINAE
n.sp. II
rakiura
disjunctum n.sp.
GIGANTISM
N.2. Subantarctic
Lord Howe Id
campbellica
blacki
ariel
labyrinthica
sciadium
LAOMINAE
flemingi
chathamensis n.sp.
leimonias
marginata
perplexa n.sp.
celia
LAOMAREXINAE
N. SUBFAM.
buddlei
moelleudorffi

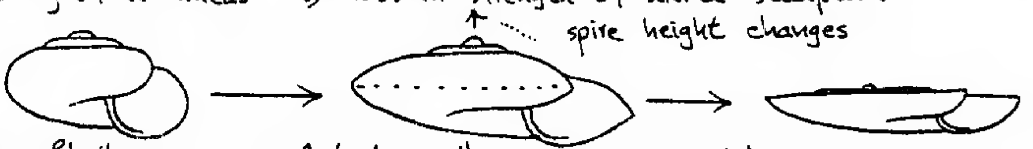
SOME MORPHOLOGICAL PROGRESSIONS INVOLVING THE TELEOCONCH

FIG. 8



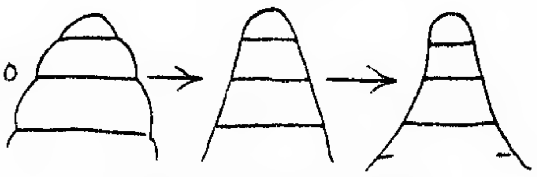
Trend towards gigantism by loosening of coiling with: a) correlated narrowing of umbilicus b) loss in strength of axial sculpture

FIG. 9



Spire flattening correlated with progressive peripheral angulation

FIG. 10



Spire angle changes

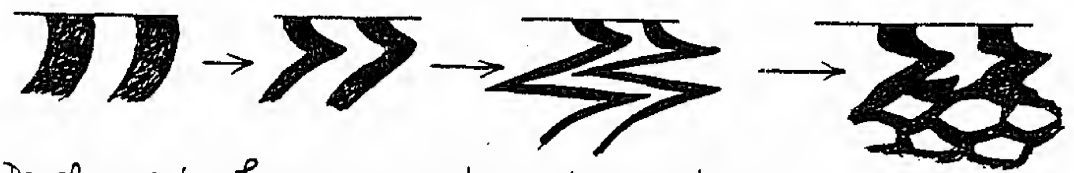
FIG. 11

Development of a peripheral carina

FIG. 12

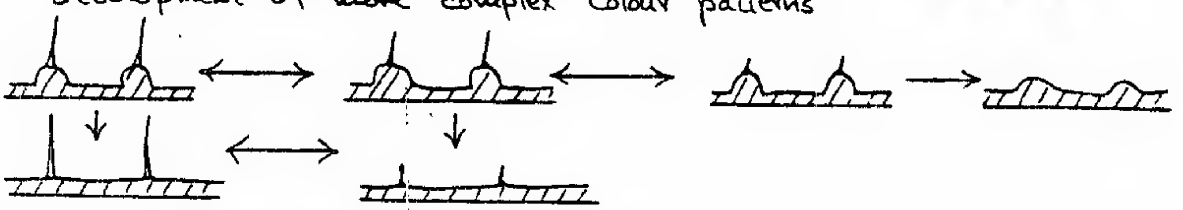
Development of aperturial barriers

FIG. 13



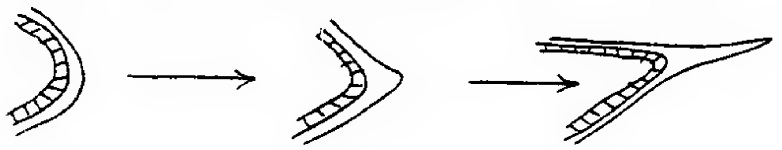
Development of more complex colour patterns

FIG. 14



Proportional changes in periostracal/calcareous components in primary axial sculpture

FIG. 15



Peripheral modification of periostracal sculpture

protoconch sculptural features (Fig. 17) or reproductive duct recognition surfaces (Fig. 18).

Concluding remarks. Solem, Climo & Roscoe (1981) have already shown just how unique N.Z. is in terms of land snail diversity. Since that paper was written the number of endemic land snails and slugs has increased to about 670 most of which are represented by well replicated material in NMNZ. This diversity is primarily a result of extensive radiations in the endodontacean families Punctidae (discussed above) and Charopidae (that I've been publishing on in dribs and corrective drabs for about 12 years).

That New Zealand has achieved this huge snail diversity must say something about a unique set of historical circumstances, the most important of which probably are:

1. Isolation (from other competing faunal elements).
2. Time (to specialise).
3. Active tectonic history (to preserve habitats).

A tectonically active chain of large islands - arranged roughly N - S across prevailing winds - in an oceanic setting was ideally suited to not only hold onto a preclimatic-fluctuation (probably already diverse) invertebrate fauna, but also to increase its diversity. Present relictual distributions probably resulting from the rigours of the last severe glaciation attest to the ability of small segments of the snail fauna to survive even under the most harsh (overall) conditions. A continuity of the forest litter habitat was instrumental in both preserving and attaining the diversity of the New Zealand land snail fauna. The endodontacean families, in particular, had the time to 'fine-tune' to their forest environment without having to compete with unrelated invasions of potentially better adapted snails (and other organisms), miniaturisation being one of the most important punctid innovations.

Other areas of the world have not followed New Zealand in this diversity glut because:

1. continental areas were too hard hit during glacial maxima, and,

2. the succession of vegetation types did not provide continuity of microhabitats;
3. existing vegetation types and climatic regimes cannot now support a diverse litter fauna (e.g. the mainly eucalypt systems of most of Australia);
4. invading competing faunal elements (same phylum or not) continually thinned-out ancestral faunas before they became fine-tuned 'wholes' that effectively had all the niches plugged.

We owe it to the rest of the world to preserve this snail diversity by preserving what is left of our forests.

* * * * * *

FIG. 16

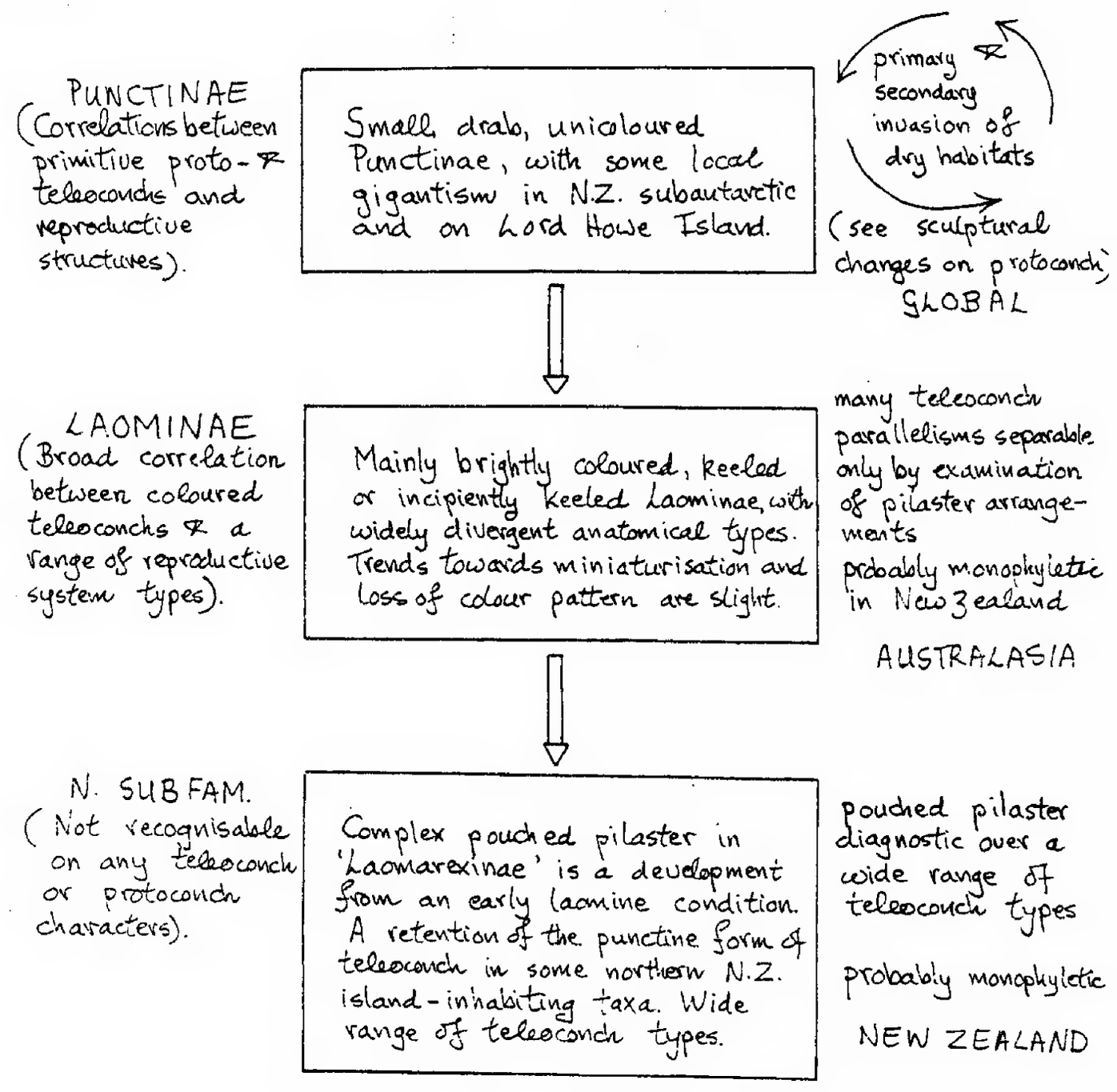
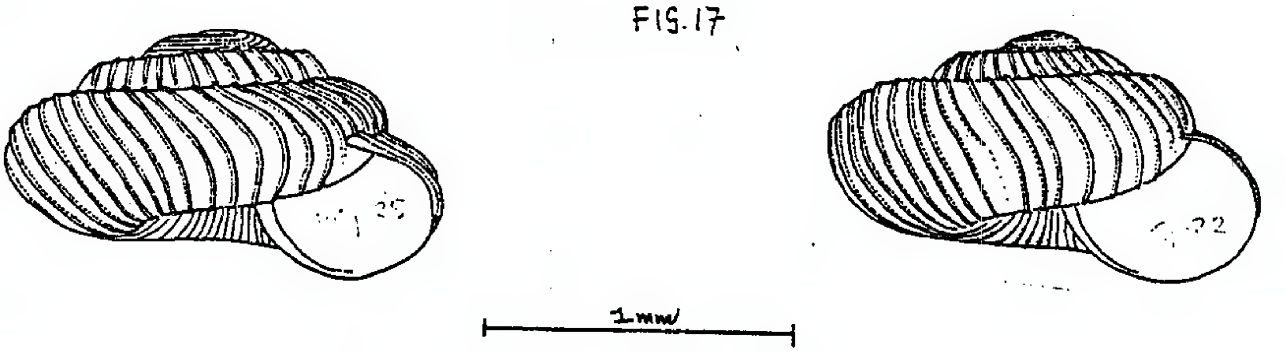
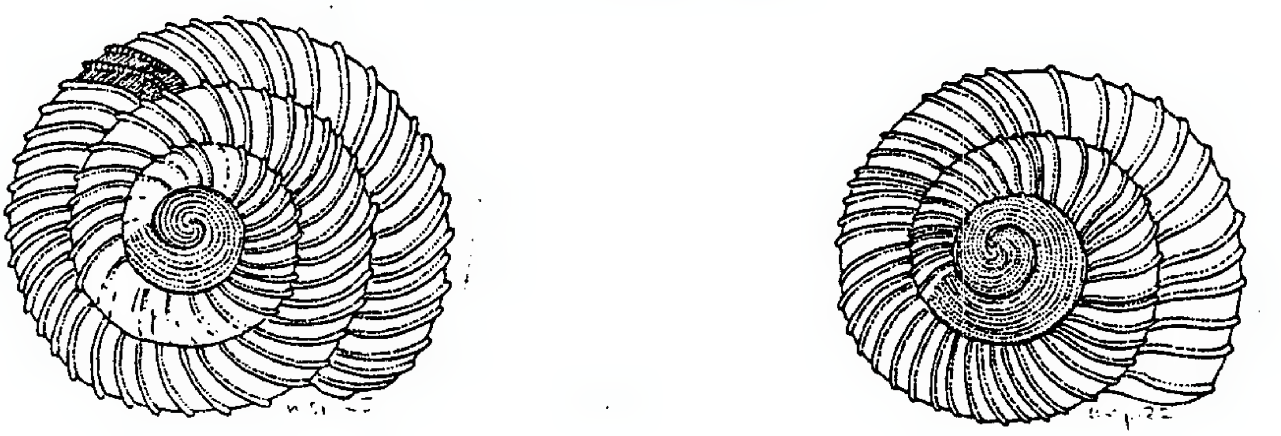
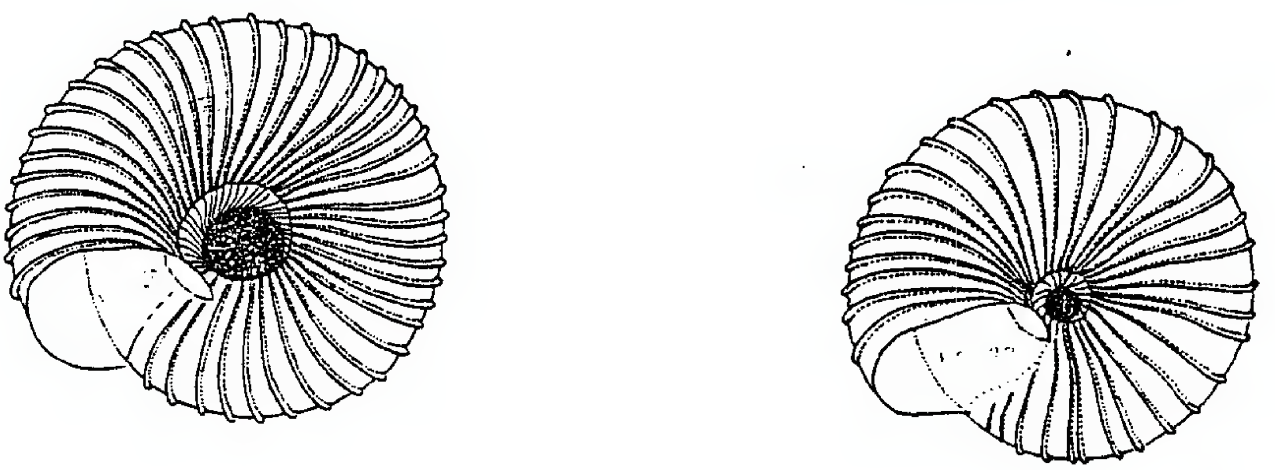

PUNCTINAE
(Correlations between primitive proto- & teleoconchs and reproductive structures).
Small drab, unicoloured Punctinae, with some local gigantism in N.Z. subantarctic and on Lord Howe Island.
primary & secondary invasion of dry habitats
(see sculptural changes on protoconch)
GLOBAL
LAOMINAE
(Broad correlation between coloured teleoconchs & a range of reproductive system types).
Mainly brightly coloured, keeled or incipiently keeled Laominae, with widely divergent anatomical types. Trends towards miniaturisation and loss of colour pattern are slight.
many teleoconch parallelisms separable only by examination of pilaster arrangements
probably monophyletic in New Zealand
AUSTRALASIA
N. SUBFAM.
(Not recognisable on any teleoconch or protoconch characters).
Complex pouched pilaster in 'Laomarexinae' is a development from an early laomine condition. A retention of the punctine form of teleoconch in some northern N.Z. island-inhabiting taxa. Wide range of teleoconch types.
pouched pilaster diagnostic over a wide range of teleoconch types
probably monophyletic
NEW ZEALAND

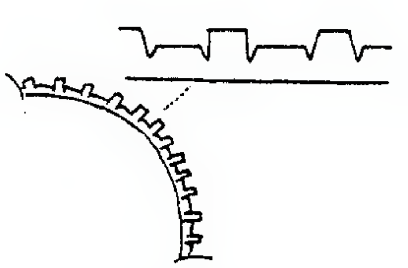
FIG. 17



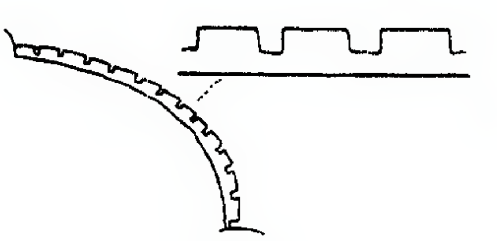
1mm







n.sp. 25 Kerr Point
North Cape



n.sp. 22
Snares Is

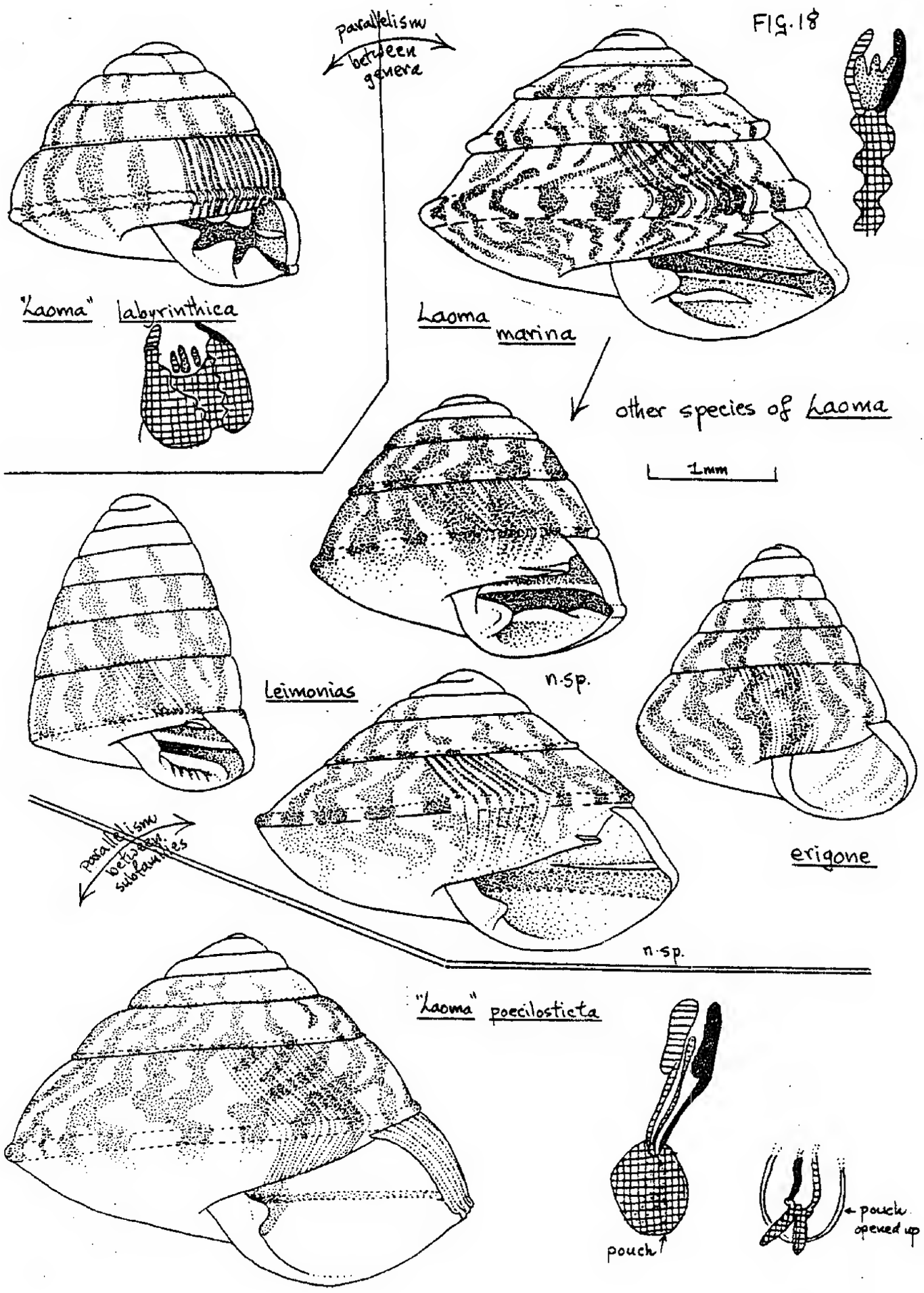


FIG. 18
parallelism between genera
"Laoma" labyrinthica
Laoma marina
other species of Laoma
1mm
Leimonias
n.sp.
erigone
parallelism between subfamilies
n.sp.
"Laoma" poecilosticta
pouch
pouch opened up

COLLECTING IN THE FAR NORTH

by P. Jamieson

Anyone who has had the opportunity to spend some time collecting in the far north knows what an interesting and profitable place it can be. The area north of Parengarenga Harbour was once isolated from the New Zealand mainland. As a consequence, it has a high proportion of endemic land snails including the large and well known Placostylus ambagiosus (and its sub-species), Paryphanta busbyi watti, Rhytida duplicata, and a myriad of minute species, some of which are still not described. However, the far north has also a great deal of potential for marine collecting. Several areas are very rewarding if one is in the know of where to go and what to look for. Therefore, I hope this article will be of use to people visiting the area, acting as a guide to likely localities, and give some idea of what species may be encountered. I have mentioned the various Placostylus colonies only in passing, remembering that they are now protected along with the rare Paryphanta busbyi watti. Information for this article has been gathered over the past ten years during which time I have visited this area six times. The length of the visits has varied from one day to two weeks, and consequently not all places have been collected on each visit; but I can say for certain I have not been disappointed.

Access to the far north is via Kaitaia, through Houhora, and thence to Te Kao and Waitiki Landing (which is the last store and petrol supply). Despite rumours to the contrary, the road is quite negotiable, and although the last section was still metal on my last visit in 1982, constant improvements are being made. At Waitiki Landing the road branches.....left to Cape Reinga and right to Spirits Bay. Most people visiting this area see only Cape Reinga, famous for its lighthouse and the "meeting of the tides", and well worth a visit it is too!

Probably the most talked about locality for marine collecting in the far north is Cape Maria Van Diemen (abbreviated for further use in this article to C.M.V.D.). This is a headland several kilometers south of Cape Reinga. Unfortunately this area is not often visited, as there is no vehicle access, and one must walk out by one of two alternative routes. A small signpost approximately four kilometres south of Cape Reinga marks the beginning of the first route. This is over a paddock, a swamp which is now bridged, and then over rolling dunes to the southern end of Te Weraki Beach (Sandy Bay on topographical maps); about one and a half hour's walk. The second route is by a steep track down the ridge from the Cape Reinga lighthouse to the northern end of Te Weraki Beach. The latter route enables one to walk along the high tide line of the beach, which provides numerous specimens of Zegalerus terraenovae and tantalising single valves of Gomphina maorum and Venericardia reinga. In smaller numbers is Sigapatella superstes. This rare shell should be specially searched for. It is easily recognised from the other species of "slipper shells" by its fine granulose sculpture. Also obtainable are single valves of Acar sandersonae and the three species of Janthina.

At the southern end of Te Weraki Stream which is easily crossed. A small rocky point is then negotiated, bringing you on to another sandy beach from which the steep sand slopes of Herangi Hill rise. These slopes are littered with the sub-fossil shells of Placostylus ambagiosus priscus. To reach C.M.V.D. headland, if the tide is high, one must climb up these slopes. If the tide is low one can continue round the coast past a few rocky outcrops and eventually come to a large sand-fan blown over the crest of a ridge which is at a lower level then Herangi Hill. The rocky point past this sand-fan

cannot be negotiated even at low tide, so the fan must be climbed if one is to continue. However, at the base of this fan, tucked right into a corner, there is usually a good washup of small shells among small stones. This would be the most exciting washup spot I have ever seen, and is where the best and most interesting material comes ashore at C.M.V.D. The following list, compiled over several visits will bear this out:-

Numbers are given for the specimens collected, and in the case of more common species, N. = numerous, and S. = several specimens.

Globisinum drewi 2
Cominella quoyana necopinata N.
Polinices simiae I
Natica migratoria 3
Sigapatella superstes S
Zegalerus terraenovae N
Buccinulum mariae 5
Duplicaria flexicostata S
Trivia merces N
Philippia lutea 2
Heliacus maorianus I
Herpetopoma mariae I
Zelippistes benhami I
Taron albolabratus I
Venericardia reinga N single valves only
Ratifusus reticulatus S
Marginella vailei N
Marginella tryphenensis I
Pterotyphis eos I
Muricopsis espinosus mariae 2
Waimatea obscura 4
Maoricrypta youngi N
Eatoniella huttoni I
Trochus camelophorus 4
Clanculus peccatus 5
Ataxocerithium huttoni I
Maurea osbornoi I

Gomphina maorum N pairs

If one can pull oneself away from this spot and struggle over the sand-fan and down the other side, there is a straight sandy beach, perhaps a kilometre long, ending at the C.M.V.D. headland itself. This beach is amazing, for it never fails to produce good specimens of the keyhole limpet Monodilepas diemenensis. They are to be found in the tiny shell drifts at and below high tide mark; but they must be searched for thoroughly. On my last visit, three hours spent on my knees yielded 60 specimens, the largest measuring 20x15mm. and also a small Umbraculum sinicum 13x10 mm which was still in perfect condition. Also washing ashore here are single valves of Gomphina maorum, Venericardia reinga, Cardita brookesi and numerous Tugali suteri and Emarginula striatula.

The C.M.V.D. headland is the home of Placostylus ambagiosus worthyi, which is subfossil in a sand slide along with Rhytida duplicata. The recent Placostylus ambagiosus consobrinus also occurs on the headland, precariously hanging on to existence under atrocious conditions. On the way back one may pass the recent Placostylus ambagiosus paraspiritus colony on the southern side of C.M.V.D. This colony is also threatened, not only by encroaching sand, but also by rats which take a heavy toll despite poisoning. Several small land snails occur abundantly at this locality also: Delos cordelia, Succinea archeyi, Phenacohelix tholoides, Tornatellinops novoseelandica, "Mocella" n.sp.aff.manawatawhia, Paralaoma caputspinulae, and "Paralaoma" n.sp. Further past this colony is a small valley which has yielded numerous subfossil Rhytida duplicata and the occasional Paryphanta busbyi watti among the Placostylus ambagiosus priscus.

...../

If one is visiting Cape Reinga itself, it is worthwhile descending the ridge to the Cape, despite the warning notice. It is precariously steep, but not unsafe if one is agile enough and does not mind the walk back up. Subfossil specimens of Placostylus ambagiosus lesleyi wash out of sand banks on the eastern side of the cape, but are rare there.

Approximately two kilometres south of Cape Reinga is the turn-off to Tapotupotu Bay. Not far from the turn-off, on the eastern side of the road is a scrubby patch of bush. This is probably the best area for small land snails in the whole of the far north. The patch of bush is unique in that quite a few new species have been described from it. Careful searching among leaf litter and perhaps a bag of leafmould taken for later searching, should reveal the following species and possibly a few others;- Cytora ampla, C.hispida, C.Kerrana, C.tepakiensis, Fectola charopiformis, F.mira, Egestula pandora, Allodiscus basilirata, A.spiritus, Phenacholex tholoides Serpho matthewsi, S.kivi, Laoma aupouria, L.sciadium, Laomarex minuta.

Tapotupotu Bay is a very picturesque place, with camping facilities including barbeques, cold showers and toilets. This would be an ideal place to stay if one intended spending several days exploring this end of the far north. However, it is a very popular place during the holiday season. I have never found much washed ashore there except a few large Janthina janthina; but it is the best place to find Placostylus ambagiosus lesleyi washed out of the bank on the beach front. The rocks at either end of the Bay could be worth searching, but I have never had the time to do so. The scrubby patch of bush over the river at the eastern end of the Bay has yielded numerous Rhytida duplicata and nice Liarea aupouria aupouria.

If time permits, a day visit to Pandora may be of interest. This is actually the far western end of Spirits Bay, and access is by a dry weather dirt road to the Te Paki Trig and then by foot to the beach itself.....about a 45 minute walk. West of the beach is (or was) the tiny colony of Placostylus ambagiosus pandora. A visit there in 1976 revealed only five live adult snails and a few juveniles. These were all sheltering under one rock and a nearby flax bush. As far as marine collecting was concerned, the only items of interest there were two valves of Anadara trapezia subfossil in the dunes above high tide mark.

Another locality of interest is Mt Kohuroraki (957 ft.), a prominent point with remnants of the original bush still intact. It may be reached from a dirt track from near Waitiki Landing. The view from the trig is worth the walk. The surrounding bush does harbour a few Paryphanta busbyi watti and a good variety of minute snails, similar to the Tapotupotu locality, but not so plentiful.

Access to spirits Bay is by an all weather metal road from Waitiki Landing which ends at the far eastern end of the Bay, at a place known as Kapawairua. There is a large camping area with barbeques, toilets and fresh water on tap; but again, it becomes a very popular place during the holiday seasons. This is a fascinating area with a tidal lagoon and a small island (Pananehe Island on topographical maps) which is accessible at low tide. Towering above this is an unusually shaped, steep sided hill, the home of the last remnants of Placostylus ambagiosus keenorum, and the remains of a former Maori burial site.

The tidal lagoon has numerous Melanopsis trifasciata, Potamopyrgus estuarinus and a very small ridged Potamopyrgus which is probably a variation of P.antipodarum.

The island is an excellent place for marine collecting, and has the advantage over C.M.V.D. in that it is equally good for live material and washups. The western side of the island is by far the most interesting. Over the years I have had a good number of Morula smithi from here. They seem to occur right at the low tide mark, under small overhanging rocks. This makes them very difficult to collect, especially if the sea is not calm. From the same habitat I have had a few Agnewia tritoniformis. Morula chaidea has also been recorded here, but I have never had the fortune to find one, yet !!!

Usually obtainable alive from the rocky platform are ...

Cabestana spengleri
Mayena australasia
Buccinulum linea linea (form multilineum aupouria)
Cominella virgata brookesi

The following is a list of species I have obtained washed up or from shell sand. Not all were collected on every visit, but each time I collect there a few more interesting items turn up. In fact, this is the sort of locality where one could expect almost anything to turn up. For instance, the very rare Liniaxis sertata has been recorded from this very spot. The list could be almost doubled by the inclusion of the myriad of very minute species from shell sand, which is very rich in this locality. Most of the bivalves in the list were collected only as single valves.

Maurea tigris
Alcithoe arabica
(depressa form, usually in worn condition)
Cantharidus purpureus
Micrelenchus dilatatus
Micrelenchus rufozonus
Micrelenchus sanguineus
Thoristella oppressa
Eatoniella albocolumella
Eatoniella huttoni
Haliotis virginea crispata
Rissoina anguina
Rissoina chathamensis
Rissoina zonata
Merelina taupoensis
Macrozafra nodicincta
Macrozafra subabnormis
Muricopsis espinosus mariae
Paratrophon quoyi
Liratilia subnodosa
Cominella quoyana necopinata
Marginella cairoma
Marinella pygmaea
Marginella tryphensis
Marginella vailei
Marginella mustelina
Pupa kirki
Cylichna thetidis
Aglaja cylindrica
Bulla vernicosa
Retusa oruaensis
Neoguraleus lyallensis tenebrosus
Amalda depressa
Cantharidella tesselata
Cirsotrema zelebori
Epitonium jukesianum
Antisolarium egenum
Umbonium zelandicum
Tanea zelandica
Duplicaria tristis
Duplicaria flexiocostata
Philippia lutea
Clanculul peccatus
Balcis articulata
Buccinulum vittatum vittatum
Waimatea obscura
Tugali suteri
Tugali elegans
Limatula maoria
Cardita brookesi
Myadora boltoni
Venericardia reinga
Pleuromeris zelandica
Offadesma angasi
Myllita stowei
Cosa laevicostata
Myllitella vivens
Gaimardia finlayi

Among the sand-dunes between the lagoon and the island it is worthwhile keeping a sharp eye out for Anadara trapezia among the deposits of sub-fossil shells. A recent visit produced 22 valves, but only a few of these were completely whole. The problem is that when Anadara is partially buried in the sand it looks like a valve of Glycymeris laticostata which is very common there. Therefore one must be patient and search carefully to secure specimens.

The dunes along Spirits Bay itself will yield specimens of the subfossil Placostylus ambagiosus spiritus, but they become more common about two kilometres west of Kapowairua. Succinea archeyi still lives under the stunted vegetation among the dunes, but can be hard to find.

Approximately one kilometre upstream from the lagoon mouth is Waitanoni Stream, better known to collectors as Waterfall Gully. This is where the water supply for the camping ground is piped from. It is good fresh water from above the small cascading waterfall which marks the beginning of the gully itself. On the rocks above the waterfall Latia neritoides, one of our freshwater limpets is not uncommon. Occasionally I have also found the fresh-water mussel Hyridella menziesi here. Abundant in the bush in this gully is Liarea aupouria aupouria, and a selection of other small snails can be found, but they are not common.

Access to the eastern section of the far north is difficult. A dry weather road does exist, winding its way out to Tom Bowling Bay and then up to the Serpentine Quarry near North Cape. However, part way along this road is a locked gate, entry past which is by permission only, and this is difficult to obtain. Therefore, if this area is to be explore, one must be prepared to don a pack and camp out.

Several routes can be taken -

1. Follow the dirt road, taking a short cut through a landrover track, eventually coming out at Tom Bowling Bay.

2. From just before the locked gate, take a now-very-overgrown track, coming out at the eastern end of the Huka Beach. This is not recommended unless one is prepared to do some "bush bashing".

3. From Kapowairua, up the ridge to Mt Unuwhao, and then by a ridge-top track through the bush toward the Huka, then by forestry tracks, basically following the ridge system, come out at the western end of the Huka Beach.

Access to Mt Unuwhao is also becoming increasingly overgrown. It is the type locality of Placostylus ambagiosus annectens and Paryphanta busbyi watti, both of which are now extremely rare there, mainly from destruction by pigs. This is also the type locality of Liarea aupouria aupouria and Cytora ampla both of which are not uncommon and reach a larger size than elsewhere, presumably because the conditions are better.

The Huka is an interesting place, with a lagoon at its western end. The unusual ridged Potamopyrgus occurs here as well. Placostylus ambagiosus annectens still persists in the bush nearby, despite ravagings by pigs. A good washup at the eastern end on one occasion produced -

Haliotis virginea crispata
Cabestana spengleri
Mayena australasia
Charonia lampas capax
Janthina exigua
Sigapatella novaezelandiae
(some nicely patterned specimens)

The rocky point at the far end of the Huka Beach is negotiable only at mid-low tide, so care must be taken to check the tides unless one wants a very arduous climb over this very steep point. This is the type locality for many minute northern species which have been obtained from shell-sand among the rocks. Any species whose type locality is recorded as Tom Bowling Bay will be from here. However I have never seen any shell-sand worth taking, just crushed grit. In rock pools I have obtained Muricopsis espinosus mariae, Cominella quoyana necopinata and Nassarius spiratus, all being empty shells inhabited by hermit crabs. The rocks, at low tide, look interesting, but I have never stayed long enough to investigate. I have always hurried round the point for fear of being cut off by the tide.

One then comes to the long sandy Tom Bowling Bay beach itself, the type locality of Placostylus ambagiosus gardneri. This sub-species is exceedingly abundant in the sand dunes beind the beach, along its entire length, together with small subfossil specimens of Rhytida duplicata. I have never found this beach profitable for marine collecting.

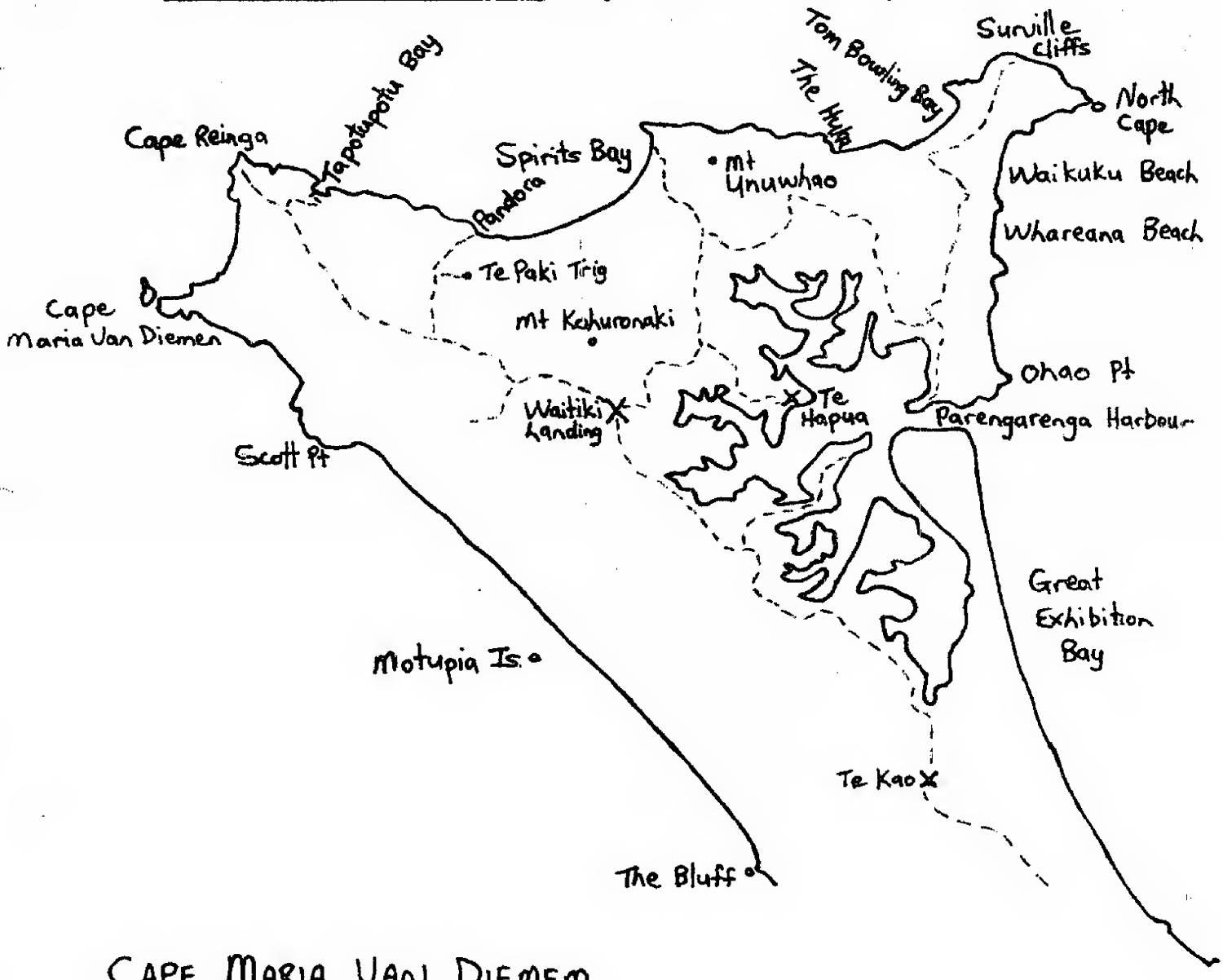
At the far eastern end of Tom Bowling Bay the dirt road is finally reached. This takes one right up to the Serpentine Quarry at the Surville Cliffs, the northern-most point of the New Zealand mainland. It is a very impressive sight standing, standing on top of the cliffs, several hundred feet high, looking out over the ocean and watching circling birds below you. Near here, the recent Placostypus ambagiosus michiei is making a come-back from near extinction. In some areas, ones that are not too steep, vegetation occurs right over the cliff face, and this is where one can find the endemic Liarea aupouria tara, along with numerous specimens of Delouagapia cordelia, Phenacohelix tholoides, Cytora kerrana, "Punctum" n.sp. On the southern side of the North Cape block Placostylus ambagiosus watti occurs among patches of coastal scrub and pohutukawa trees.

Waikuku Beach stretches south from the North Cape block. The dunes behind the beach are littered with more subfossil Placostylus ambagiosus gardneri. I believe good washups occur there at times. My best finds at this locality were a perfect Alcithoe arabica (depressa form), an Alcithoe jaculoides, and a few large Janthina janthina.

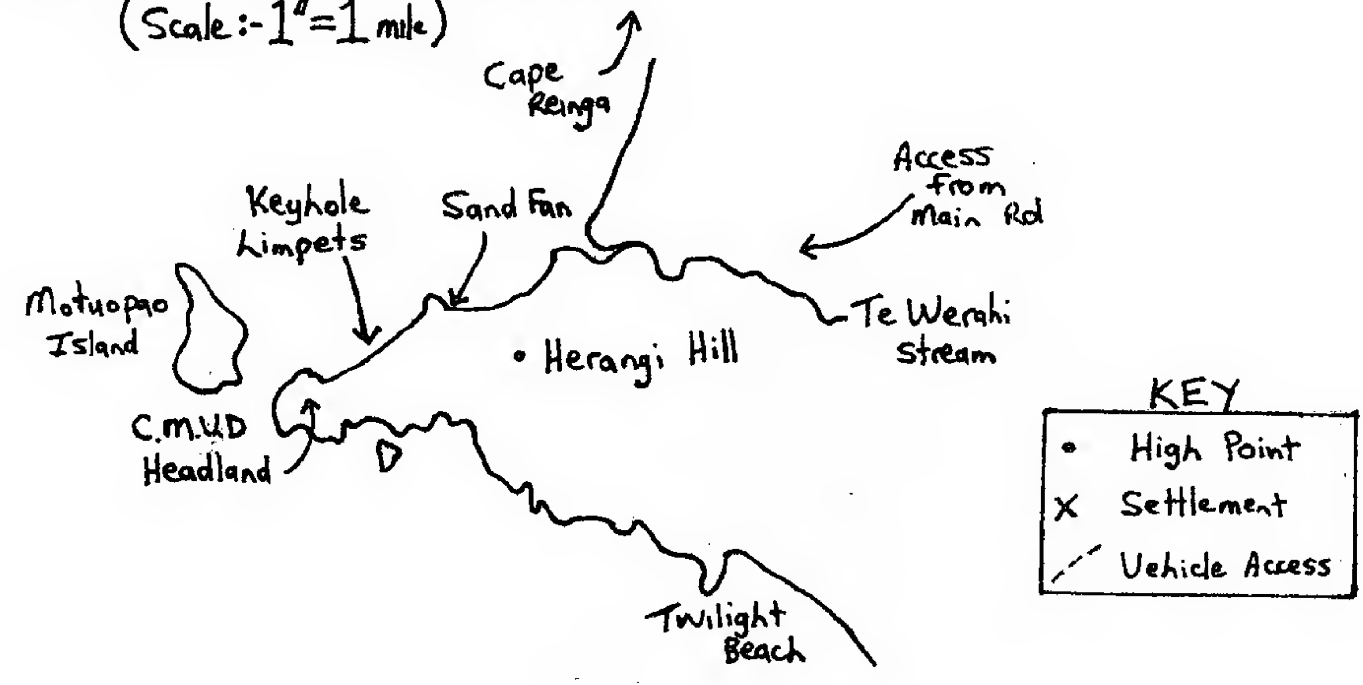
Further south again is Whareana Beach, but to get to it the steep point between it and Waikuku Beach must be climbed. Here again subfossil Placostylus ambagiosus gardneri occur in the dunes, but not so commonly. Behind the beach, the small colony of Placostylus ambagiosus whareana seems to be surviving quite well. A small stream at the southern end of the beach has yielded specimens of the tiny fresh-water limpet Gundlachia under water lily leaves. Further south again Placostylus ambagiosus hancoxi has been recorded from several small patches of coastal scrub, but it is rare in most of these.

For those lucky enough to spend a few days exploring the far north a good variety of material is available. If time is limited I would suggest heading for Spirits Bay where collecting is easy.

THE FAR NORTH (Scale:-1" = 4 miles)



CAPE MARIA VAN DIEMEN (Scale:-1" = 1 mile)



Remember, however, that the island is accessible only at low tide, and time your visit accordingly. If you have more time, then some of the other interesting places can be visited; but a full two weeks would be needed to visit all the localities I have mentioned.

BOOK REVIEW

"Seashells of Southwestern Australia", by Dai Roberts and Fred Wells. (Dr F. Wells is Curator of Molluscs at the Western Australian Museum) Published by Creative Research, Perth, 1981.

This volume of 91 pages is a welcome addition to the literature on the molluscs of Western Australia. The book contains a quantity of introductory information on the classification of molluscs, habitats of shellfish, Western Australian marine climates, collecting equipment, the cleaning and displaying of shells.

Coloured illustrations are provided of 223 species (nine chitons, 137 gastropods, 77 bivalves). They are all in good colour, and should enable collectors to be quite sure of the identification of the species. The only information in respect of each species is a general outline of its area of distribution and the size of good average specimens. An aspect that may be a disappointment to beginners is the absence of actual descriptions of the shells.

This book will be very useful to beginners, while containing a quantity of useful information for the more advanced collectors of West Australian shells.

ANOTHER LARGE WASH-UP

by Betty Wolf

In May 1982 I was given a box of Atrina zelandica shells from Raumati Beach. All were beautifully fresh shells. The friend who brought them had never seen them before, and said they were there in hundreds.

A month later, I was at Waikanae for a shelling week-end and found shells of this species along the high tide line from the mouth of the Waikanae River northwards. I did not go south of the river mouth. They were also in quantity on Te Horo Beach along the high tide mark. There they were half covered with sand, indicating that they had been there for a little while. They were all fresh shells and perfectly clean. I have found them alive at Paraparaumu Beach, south of the Waikanae River mouth on other occasions, and a few odd shells washed up on the high tide line, but have never seen them in such numbers as were on the beach in June this year.

SOME UNUSUAL FINDS FROM SHELL SAND AROUND THE WELLINGTON DISTRICT

by Mary A. Wotton

Collecting from shell sand requires a lot of patience and fairly good eyesight, supplemented by magnifying glasses and/or a microscope. Specimens from this cource take up far less room than other shells, and are often rewarding as this is the only way that many of them can be obtained. So one is far more likely to acquire something unusual in this way than by collecting in the littoral zone.

One of my most puzzling finds which has only recently been identified came from shell sand collected off the wreck of the ferryboat "Wahine" when it was brought up in 1974. It resembles a juvenile Naticid and is a smooth, thin brown shell, less than 2mm. in size. Mr Bruce Marshall, to whom I went for help, has puzzled over it several times, and it was only recently by comparing it with specimens in the National Museum, that he identified it as Macquariella aucklandica Powell 1933. Macquariella is a genus in the Family Littorinidae, and it would never have occurred to me to look there as species of that Genus in Zealand occur only at Macquarie Island, Antipodes, Auckland Islands, Chatham Islands and Stewart Island. How did it get into the container of sand which was found on the "Wahine"? Or,more correctly, did the sand in the container come from Wellington Harbour, or from some other locality?

Zerotula is another Genus one would not expect to find around Wellington; but shell sand from Karehana Bay, Plimmerton turned up a specimen similar to Z.bicarinata (Suter 1908). The shell is minute, round and flattish, with a sunken spire and a wide umbilicus.

Also from Karehana Bay, and near the Plimmerton Fire Station, were several specimens of a Merlina similar to M. plaga Finlay 1927, pure white in colour. All shell sand collectors will be familiar with species of Merelina as they occur all round New Zealand. The Genus belongs in the Family Rissoidae.

And finally, two new additions to the Wellington Harbour check list -

> Balcis titahica (Suter 1908), from Lyall Bay shell sand, and a new species of Comptella (Family Mutricidae) also from Lyall Bay. Comptellas are small, solid shells with a loosely coiled protoconch bearing one or two spiral keels. This is another shell one would not normally expect to find in the Wellington area.

NEW LOCALITY FOR NOTOACMEA BADIA

by Mary A. Wotton

As a result of reading my article on Notoacmea badia Oliver, in "Cookia" Vol 4 No 3 Oct 1981, Peter Jamieson showed me some limpets which he had collected in 1979 at Kaka Point, about ten miles south of Balclutha, between the mouth of the Clutha River and Nugget Point Lighthouse.

The limpets were collected from smooth, exposed rocks in the mid to low tide zone, and are identical with specimens of N.badia collected at St Clair, Dunedin.

This would indicate that N.badia does not originate at St Clair. Is Kaka Point its southernmost limit, or does it occur even further south?

A COLLECTING TRIP TO KAIKOURA

by Jenny Raven

5.30a.m. on the morning of Saturday the 5th June 1982 saw nine Wellington Shell Club Members on the Picton Ferry Terminal wharf. Most of them had gone through a night without sleep, and survived one of the worst overnight crossings of Cook Strait.

Undaunted, and refreshed with a 6am, breakfast, the intrepid party set off by mini-bus to Marfell Beach. There was nothing too exciting there this time. Some good specimens of Argobuccinum and Haliotis virginea were collected, but there was nothing new to add to the list published in "Cookia" Vol 1 no. 5. Four hours in the wind and rain was enough, so we moved on to Kaikoura.

A stop (to wake up) at the mouth of the Iron Gate Stream produced Rhytida greenwoodi stephenensis.

Kaikoura was reached at last, and although an early night was a must, nobody was prepared to forego the chance to visit Beverly Elliot and to view her collection. This was certainly time well spent.

The next day, with Beverly as leader, we set off from Browns Bay. Four or five hours later we returned via a hill-top bluff (that Meg will long remember) with full bags and happy faces. We had covered Browns Bay, Atia Point and East Head. The weather had been fine and the finds numerous. The most exciting finds were a few live Montfortula rugosa in high tide pools at East Head. Details of our other finds that day are as follows -

Browns Bay

Sypharochiton pelliserpentis
Amaurochiton glaucus
Ischnochiton maorianus

Large specimens of the above three under rocks towards low tide.

Buccinulum vittatum littorinoides (= kaikouraense)
Siphonaria zelandica
Cellana ornata

Large specimens of the last two on mid-tide rocks.

Atia Point

Sypharochiton torri
Diaphoroplax biramosus
Lepsithais lacunosus ... alive under rock crevices
Patelloida corticata ... alive on extreme low tide rocks
Buccinulum pallidum

Notoacmea scopulina ... alive on extreme low tide rocks
Cellana denticulata ... very large specimens on mid-tide rock platform
Cellana strigilis redimiculum ... a few on extremely exposed rock faces jutting out into the sea

Atia Point to East Head

Turbo granosus ... 3 washed ashore
Cookia sulcata ... washed up
Turbo smaragdus ... washed up, very large
Notoacmea daedala.. alive under rocks
Atalacmea fragilis. alive

East Head

Montfortula rugosa .. alive in high tide rock pools

Following this, some of the party were not satisfied with a full day of shell collecting and set off for the base of Mount Fyffe, returning a short time later with specimens of Wainuia fallai. A restaurant meal finished off a good day. The next day, Sunday, was to be our last day in Kaikoura. This time, again with Beverly, we started from the opposite side of the peninsula. Armers Beach provided good sized specimens of Cellana flava and Cellana radians, also some Benhamina obliquata. Then for those of us who were daring enough and prepared to take off our trousers, it was a case of getting into the water up to the thighs to follow Beverly across a narrow stretch of water to Seal Island. There some of us were lucky enough to collect Montfortula rugosa. Other species collected at Seal Island were -

Cellana denticulata .. large specimens on the rock platform
Diaphoroplax biramosus .. a few on extremely low tide rocks
Patelloida corticata .. common on low tide rocks
Cellana radians
Buccinulum vittatum littorinoides .. common under rocks towards low tide
Benhamina obliquata .. in mid-tide rock crevices
Buccinulum pallidum .. one under a rock towards low tide

The final day was rounded off with another visit to Beverly Elliot, and for most folk some additions to their collections. At last it was time to go and with farewells said to Beverly and her family, we headed off to Picton. One final look at Marfell Beach, in sunny weather this time, produced some lovely orange chlamys and more Buccinulums, also one very large apecimen of Perna canaliculus 185mm. long.

Fortunately our return trip from Picton was calm. Overall, the trip was a particularly successful and most enjoyable one. All members of the party were particularly grateful for the advice and guidance of Beverly Elliot who made our trip just that much more worth while.